Economics and Organization of Logistics
7 (1), 2022, 39–52
DOI: 10.22630/EIOL.2022.7.1.3

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Food shopping preferences in the context of logistic chains of food supplies on the example of consumers from the Podkarpackie voivodeship

Preferencje zakupowe żywności w kontekście logistycznych sieci dostaw żywności na przykładzie konsumentów z województwa podkarpackiego

Abstract: The article focuses on consumers' dilemmas regarding the choice of food products. Growing consumer awareness is reflected in everyday choices and has both economic and public health significance. Public awareness is generating a tendency to pay attention to health aspects by choosing fresher, better quality and less processed products. Consumers are increasingly interested in short food supply chains and shortening the time it takes to move food "from the field to the table". Purchasing behavior is conditioned, inter alia, by the individual hierarchy of values professed by the consumer, in which short food supply chains are identified with better quality, lower price and reduced trade margins. Preferences for local and regional products are also observed. The market provides such opportunities, as legal changes introduced in Poland in 2016–2017 enabled farmers to legally sell food products directly in an unprocessed as well as processed state. Such sales are carried out in short supply chains. A similar phenomenon is also observed among farmers in many EU countries. Short food supply chains play an important role in the process of creating market advantage of agricultural producers, as food products are quickly delivered to the final recipient. Local markets become very important in this case and direct selling, which lost its importance at the turn of the 20th and 21st centuries, is gaining popularity again. Logistical food supply chains are considered in various scientific fields. They combine organizational and technical, economic, social as well as cultural, and health dilemmas. The aim of this study was to identify preferences of food supply chains in the context of consumer behavior of the inhabitants of south-eastern Poland. The survey was conducted using the CAWI (Computer-Assisted Web Interview) method. The survey shows that respondents associate food quality with the length of the supply chain, in the declarative sphere, they prefer short food supply chains, but do not use them. A sizeable proportion of respondents said they were willing to pay slightly more for safe and wholesome food. Research has confirmed that the modern consumer increasingly recognizes the importance of the healthiness of products, and links this to shortening the food supply chain.

Key words: shopping preferences, consumer, food products, Short Food Supply Chain (SFSC), logistics

JEL codes: D12, E21, L91, Q13

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Synopsis. Artykuł koncentruje się na dylematach konsumentów związanych z wyborem produktów żywnościowych. Rosnąca świadomość konsumentów znajduje odzwierciedlenie w ich codziennych wyborach i ma znaczenie zarówno dla gospodarki, jak i zdrowia publicznego. Świadomość społeczeństwa rodzi tendencję do zwracania uwagi na aspekty zdrowotne poprzez wybór świeższych, lepszych jakościowo i mniej przetworzonych produktów. Konsumenci są coraz bardziej zainteresowani krótkimi łańcuchami dostaw żywności i skracaniem czasu potrzebnego na transport żywności „od pola do stołu". Zachowania zakupowe są uwarunkowane m.in. indywidualną hierarchią wartości wyznawaną przez konsumenta, w której krótkie łańcuchy dostaw żywności utożsamiane są z lepszą jakością, niższą ceną i mniejszymi marżami handlowymi. Obserwuje się także preferencje dla produktów lokalnych i regionalnych. Rynek stwarza takie możliwości, gdyż zmiany prawne wprowadzone w Polsce w latach 2016–2017 umożliwiły rolnikom legalną sprzedaż bezpośrednią produktów żywnościowych zarówno w stanie nieprzetworzonym, jak i przetworzonym. Taka sprzedaż odbywa się w krótkich łańcuchach dostaw. Podobne zjawisko obserwuje się również wśród rolników w wielu krajach UE. Krótkie łańcuchy dostaw żywności odgrywają istotną rolę w procesie tworzenia przewagi rynkowej producentów rolnych, gdyż produkty żywnościowe są szybko dostarczane do finalnego odbiorcy. Bardzo ważne stają się w tym przypadku rynki lokalne, a sprzedaż bezpośrednia, która straciła na znaczeniu na przełomie XX i XXI wieku, ponownie zyskuje na popularności. Logistyczne łańcuchy dostaw żywności są przedmiotem rozważań w różnych dziedzinach nauki. Łączą one w sobie dylematy organizacyjno-techniczne, ekonomiczne, społeczne, kulturowe i zdrowotne. Celem pracy było określenie percepcji oraz preferencji dotyczących łańcuchów dostaw żywności w kontekście zachowań konsumenckich mieszkańców południowo-wschodniej Polski. Badanie zostało przeprowadzone metodą CAWI (*Computer-Assisted Web Interview*). Z badania wynika, że respondenci wiążą jakość żywności z długością łańcucha dostaw, w sferze deklaratywnej preferują krótkie łańcuchy dostaw żywności, ale z nich nie korzystają. Znaczna część respondentów zadeklarowała, że jest gotowa zapłacić nieco więcej za bezpieczną i zdrową żywność. Badania potwierdzają, że współczesny konsument coraz częściej dostrzega znaczenie zdrowotności produktów i wiąże to ze skróceniem łańcucha dostaw żywności.

Słowa kluczowe: preferencje zakupowe, konsument, produkty spożywcze, krótki łańcuch dostaw żywności (SFSC), logistyka

Introduction

The agri-food sector, also called the agri-food sector, is interpreted as one of the basic members of agribusiness and elements of the agricultural environment, and in the case of Poland it is strongly differentiated in regional, natural, social or organizational and economic terms.

For many countries, including the EU, food production and sale are treated as one of the priority directions. Also very important are links between entities involved in the process of production and sale of food. Therefore, many factors directly and indirectly influence their contemporary shape and image, and additionally, the deterioration of bargaining power of farms and, above all, their influence on product price and shelf life has become visible. There is a retreat from the hyperconsumption that dominated for a long period and a turn towards limited and sensible consumption [Michalczyk 2018].

Food as defined in Article 2 of Regulation (EC) 178/2002 of the European Parliament and of the Council of 28 January 2002, means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be, ingested by humans. It can be concluded that food quality is perceived by consumers in relation to health quality through safety, nutritional and sensory value, availability, and price [Balon et al. 2016, Stenmarck et. al 2016]. Logistics in the supply chain is very important from the point

of view of the consumer and the rest of the food economy. There is variation in the food processing degree and the complexity of logistics from producer to consumer in the food supply chain. This entire process has implications for the economic and health aspects of food as perceived by consumers [Strużyna 2020].

The supply chain consists of a network of entities involved, through upstream and downstream links, in processes and activities that create value in the form of products and services directed to the final consumer [Stadtler and Kilger 2008]. With regard to the food supply chain, three important economic sectors are identified: agriculture, food processing, and distribution in the form of wholesale and retail food trade. It is assumed that the fewer intermediate links in the chain, the better food quality and the better value for money for the consumer. However, it should be stressed that all activities related to the management of waste generated in the chain and the flow of information, including the execution of all payments, are also closely linked to supply chains [Mulawka 2021]. Individual food consumer choices are increasingly becoming a reflection of the value system and contestation of highly processed food distribution. On the other hand, there are tendencies to return to the historically oldest distribution channels in the form of direct sales. Similarly, short supply chains "from farm to fork" are being promoted in European Union countries, where local production, processing and distribution are gaining importance [Szymańska 2019]. The Short Food Supply Chain (SFSC) is defined as a chain involving a limited number of economic entities engaged in cooperation, local economic development, and close geographical and social relationships between food producers, processors, and consumers [Kneafsey et al. 2020]. Such a chain is based on minimizing or even reducing to zero the number of intercessors between a farmer and a consumer. Several types of SFSC can be distinguished, related to sales on the farm, collective sales to public institutions, local sales practically in the production region, or through cooperatives of small local farmers. In the case of SFSC, the social values associated with direct contact between the producer and the consumer, and the economic and environmental values, deserve attention [Kneafsey et al. 2013]. Short food supply chains provide an alternative and cost competition to longer chains, in which agricultural producers often lose their individual bargaining power and the product loses its personalization by becoming anonymous. In the EU, an average of 15% of farms sell more than half of their production in short channels, directly to consumers [Augĕre-Granier 2016]. Among other things, the SFSC aims to improve product quality and reduce waste [Maulawka 2021].

Food supply chains comprise a number of entities involved in the flows of goods, services, and information between the producer and the consumer [Stadtler and Kilger 2008]. Consumer preferences regarding the length of food supply chains and the prospects for short chains were the subject of this research.

The consumer in the food market

At the beginning of the 21st century, clearly visible became the trend towards healthy eating, often referred to as the fashion for healthy food. In this trend, as noted by the Institute of Food and Nutrition [Jarosz n.d.], it is important to apply the principles contained in the pyramid of healthy eating. When current food trends taking into account, attention is paid to the origin of products, highlighting their local provenance and ecological and health aspects, as well as their environmental friendliness or affordability [Clausnitzer 2021]. Consumers

are increasingly health-conscious. The environmental performance of products, social responsibility, and sustainable consumption, as well as co-consumption and smart shopping, are also becoming important [Sobczyk 2018].

Consumers constitute a diverse group in terms of psychological, sociological, cultural, and economic characteristics. These differences influence purchase behavior. They relate to preferences for product quality, places of purchase, access to information, and a range of other distinctions [Melski et al. 2016]. Consumer behavior is a whole process of coherent actions connected with the fulfilment of consumption needs, taking into account all social, cultural, and economic decisions. It is influenced by marketing activities on the part of producers and sellers [Kieżel 2010, Stasiuk and Maison 2014, Baran et al. 2017, Grzega and Kieżel 2017].

Consumers increasingly pay attention to the fact that food has moral, health, social and aesthetic importance. It translates into shopping habits and buying organic products from small shops in local markets. It is about satisfying the aesthetic experience of shopping. It is about avoiding poor nutrition, unhealthy habits, eating fast food, or eating on the run. [Kokkorisa and Stavrova 2021].

Today's food market is 75% created by modern forms of trade, mainly hypermarkets, supermarkets, discount shops, chains of small food shops [Maciejewski 2018]. The great success of discounters in the food trade is linked primarily to low prices but the currently fashionable "smart shopping" trend too, characterized by the pursuit of good quality goods at relatively low prices [Mróz 2013]. Poles are changing their shopping habits. They choose various forms of commerce, preferring traditional neighborhood shops and discount shops located on their way from work. They point out that they save time and effort from the need to travel to large outlets, where they occasionally go for large enough purchases [Maciejewski 2018].

With regard to the COVID-19 pandemic situation, nearly one-third of the Polish population carried out their food shopping online. It was emphasized, however, that shopping in traditional shops was much preferred. It should be highlighted that the shop location and the local origin of the products are important for Polish consumers. It is worth noting that 73% of Poles surveyed declared their willingness to pay a higher price for the opportunity to buy products of local origin [KPMG 2020]. The COVID-19 pandemic changed consumers' market behavior, as they focused to some extent on aspects related to feelings of fear and uncertainty, safety risks, and even panic when buying food [Ben-Hassen et al 2020, Chauhan and Shah 2020, Cranfield 2020, Lins and Aguino 2020, Yuen et al. 2020].

Food supply chains

The European Commission is increasingly promoting SFSC-compliant solutions, which are closely linked to the development and strengthening of local markets that bring together sellers and buyers of food products in a specific limited territory. At the same time, the aim is to reduce the excessive length of food supply chains associated with industrial-scale production. Highly processed food production and long supply chains are usually associated with a loss of nutritional value of food. SFSCs bring agricultural producers closer to consumers, to whom they thus offer food of better quality, organic, produced with reduced use of synthetic chemicals, at a competitive price, produced in a way that is more beneficial to local

communities and the environment. The Common Agricultural Policy 2021–2027 assumes that SFSCs and local markets will increasingly be instruments for shaping more integrated rural and agricultural development policies, while demonstrating the importance of small farms in the agricultural market. This approach is reflected in the European Green Deal Strategy, which emphasizes the importance of the Farm-to-Fork Programme focused on reducing the use of chemical pesticides - by 50% by 2030. The programme also aims to reduce the use of mineral fertilizers and provides Europeans with healthy, affordable and sustainable food. It is also intended to contribute to the development of sustainable consumption, reduce food loss and waste, and prevent food adulteration in the supply chain. The Farm to fork strategy is a tool to develop and strengthen local markets, bringing farmers together in the collective production, distribution and sale of food. Collective action, and thus the promotion of SFSCs, creates opportunities for farmers to increase their sales opportunities and for consumers to have greater and more sustainable access to local, healthier food [Serafin 2020].

A short supply chain as defined in EU Regulation 1305/2014 is a supply chain involving a limited number of operators engaged in cooperation, bringing about local farm development and characterized by geographical and social links between producers, processors and consumers [Dz.U UE L 347/487]. It was later clarified that these are only supply chains in which no more than one intermediary is involved between the farmer and the consumer [Dz.U. UE L 227/1]. This system shortens not only the physical distance between the producer and the consumer of food, but also in a social sense by emphasizing direct, personal contact.

Short supply chains are organized to maximize consumer satisfaction, minimize the number of intermediaries, ensure higher food quality resulting from the elimination of storage and repackaging. They also allow reducing geographical and social distances between links in the chain [Tundys 2015, Szymanska and Lukoszova 2019].

Farms creating inter-regional competitive advantages create short supply chains that play an important role in the agri-food sector, where reaching the consumer quickly is essential. Short supply chains are important in this case, as they shorten the time for products to reach the final consumer from the place of production. This enables the implementation of the so-called 7R formula, i.e. supplying the right product, right quantity, right conditio, right place, right time, right customer, right price [Matwiejczuk and Tłuczak 2020].

Forms of SFSC include direct sales through markets, online or direct delivery to the consumer, collective direct sales in which products are sold locally through specialized retailers, extended chains through partnerships in the form of cooperatives or producer associations [Gali and Brunori 2013, Renting et al. 2013]. With regard to food products, direct selling can take the form of direct selling on the farm so-called 'at the door', selling at a farmers' market, selling at the roadside, selling directly at home, selling online, selling in the form of 'collect yourself', neighborhood selling [Weed 2019].

Direct sales represent an opportunity for farmers to increase their own income and their own brand, but also for consumers to have easier access to food of better quality, better taste and known origin. Direct sales should become the basic and simplest channel for distributing local food. Thanks to this form of sale, food producers gain a larger share of the final price of the product and more feedback from the customer, through which they can better adapt the assortment to their needs and improve the image of the farm. For the consumer it is mainly higher quality of products, better health and nutritional values of food, favorable price/quality relation, certainty of product origin, direct contact with the producer, greater availability of

niche products, positive impact on the local economy, maintaining social ties [Kawecka and Gębarowski 2015].

Direct sales and local markets within the European Union have, unfortunately, been in decline for many years, losing their importance, which is confirmed by European Parliament data showing that only 15% of EU farms use this form for direct sales of more than half of their products. The form of direct selling is least popular in Spain and Malta, while it is most popular in Greece, Slovakia, Hungary, Romania and Estonia [Augère-Granier 2016]. According to data from the Ministries of Rural Development and Agriculture, in Poland only less than 2% of farmers make direct sales [Serafin and Pilis 2020]. However, it should be remembered that in Poland it was only in 2017, with the introduction of an innovative form of agricultural activity related to agricultural retail trade, that the regulations governing processing and small-scale sales were tidied up and simplified.

One-third of food produced goes to waste [Dobrowolski 2018]. Food waste should not be equated with losses in the supply chain. Wasted food is eliminated from the agro-food chain mainly for economic reasons or because it has exceeded its expiry date [Kwasek 2016]. Food waste occurs throughout the food chain, or in simpler terms, "from field to table" [Krajewski et al. 2014] and mainly concerns households – 53%, processing – 19%, catering – 12%, production process – 11% and wholesale and retail – 5% [Kaszuba 2019]. In industrialized countries, food losses are the same as in developing countries, while the stage at which they occur differs. In developing countries, more than 40% of food losses are related to the harvesting and processing phase, while in countries industrialized, more than 40% of food losses occur in the retail trade [FAO 2011]. Processing accounts for about 19% of food losses in the EU, and food losses and wastage have become a significant problem in the economic model of the food production sector. Ensuring widespread access to quality food under current conditions of temporary water and energy scarcity or extreme climatic situations poses a growing local challenge. One of the basic causes of food losses is very often human errors occurring in the production process [Szczepaniak and Grochowska 2020]. Optimized food logistics is an essential element in food waste reduction, which involves identifying weaknesses in the chain [Strużyna 2020].

Purpose and methodology of the study

The aim of the study was to identify the perception and preferences of food supply chains in the context of consumer behavior of the inhabitants of south-eastern Poland. The subject of the study was food consumers' preferences concerning food supply chains. The subjects of the study were adults. The research area covered south-eastern Poland (Podkarpackie Voivodeship). The research was conducted in late 2019 and early 2020. The study included consumer beliefs about the importance of food for maintaining health, the quality of food purchased, determinants, and purchase preferences. The study was exploratory in nature. The following research questions were formulated:

- Do consumers link food quality to supply chain length?
- Do consumers prefer short food supply chains?
- How important is product price in choosing the supply chain?

Responses to the research questions were used to identify preferred features of food chains.

The study was carried out by means of a diagnostic survey with a questionnaire form. The technique used was CAWI (Computer-Assisted Web Interview). The survey was partial, non-probabilistic, and the respondents were selected by a random method. At the first stage, the questionnaire was handed over to 120 people who had invited other people to the study. The condition of participation in the research was a place of residence within the Podkarpackie voivodeship. The total number of reliably completed questionnaires was 409. The research tool was a questionnaire form. It was constructed in the form of a series of statements (diagnostic theses), which respondents assessed for consistency with their beliefs. The questionnaire form contained wording to identify the habits and beliefs of the respondents. Theses referred to the importance of food in maintaining consumer health, shopping habits, perception of highly processed food, etc. Another group of theses made it possible to diagnose shopping habits, attitudes and propensity to use SFSC, propensity to pay higher costs for high quality food. A bipolar Likert scale with a neutral middle value was used for the assessment. On the scale, value 1 meant definitely no; 2 – rather no; 3 – neither yes nor no; 4 – rather yes; 5 – definitely yes. The form also allowed the recognition of main socio-demographic characteristics such as age, gender, education, place of residence. The results were subjected to statistical analysis. Based on the collected material, cluster analysis was performed using Ward's method, the basic and categorized structure of responses was calculated, and Pearson's correlation analysis was conducted.

Results

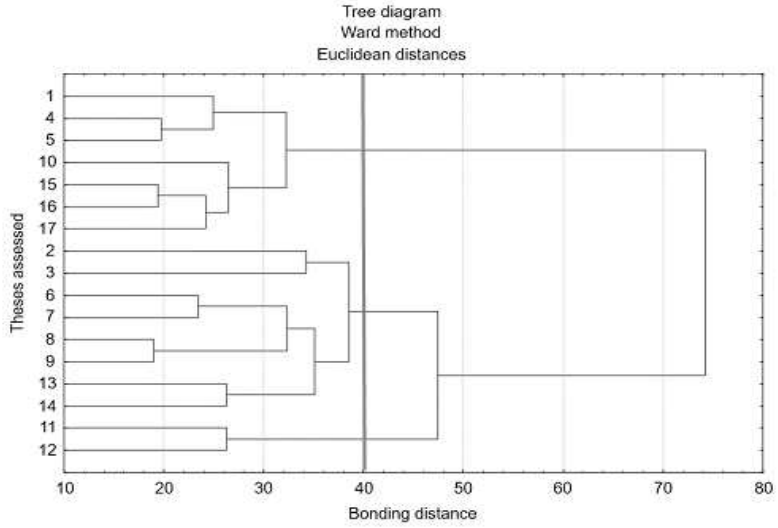
In the surveyed group of respondents, 53.1% were women, and 46.9% were men. There were 26.7% people with higher education, 45.7% with secondary education, 18.1% with vocational education, and 9.5% with primary education. Rural areas were inhabited by 47.7% of respondents, 12.5% lived in cities up to 10 thousand inhabitants, 12.2% in cities with 10––40 thousand inhabitants, and 27.6% in cities with over 40 thousand inhabitants.

Based on the collected material, cluster analysis was conducted using Ward's method (Figure 1). Table 1 presents the rating structure of individual diagnostic theses and the average value of the ratings. Cluster analysis makes it possible to separate homogeneous subsets of the objects in the study group by combining them into groups that are relatively homogeneous internally and relatively diverse among themselves [Agboola and Joel 2017]. The cluster analysis conducted in the ‘binding distances relative to binding stages' section showed an increase in distances above $y = 40$. Cutting off the dendrogram at this position allowed three clusters to be distinguished.

In the first cluster, comprising 7 subjects, the formulations concerned beliefs about the relationship between food quality and maintaining good health (theses 1, 4, 5). These theses found strong support among respondents. Table 1 shows that over 70% of respondents support these formulations. This cluster also included theses related to perceptions of short food supply chains (SFSC) (thesis 16), high-quality traditional food products (theses 10, 15), and respondents' willingness to pay higher costs for safe and wholesome food (thesis 17). The structure of the evaluations of these theses is shown in Table 1. In this case, the most numerous groups of evaluations referred to the value 4 – rather yes.

The second cluster included 8 theses that referred to specific behaviors. This cluster included formulations about taking care of one's health (theses 2, 3) and conscious food purchasing (theses 6, 7). In this case, the most frequent rating was 4 - rather yes (Table 1). The conviction about the safety of the purchased food (thesis 8), was assessed ambiguously. 47.4% of the respondents indicated the rating "neither yes nor no", while 44.7% of the people surveyed claimed that they buy safe food (Table 1). This cluster also included theses regarding the declaration of use of SFSC (theses 13, 14). Just over 40% of respondents confirmed the use of such chains (Table 1).

The last and smallest cluster contained two theses. The first referred to the criterion of low price when buying food (thesis 11). In this case, the thesis was evaluated negatively (Table 1). The second thesis concerned the preference for shopping in hypermarkets, which is usually associated with long logistics chains (thesis 12). Such a preference was reported by 44.3% of respondents (Table 1).



Cluster 1: 1 – Food is a major factor in shaping health; 4 – Synthetic preservatives and colourings can be harmful to health; 5 – Genetically modified products can cause health problems; 10 – The origin of the product is important to me; 15 – I believe that traditional foods ensure high biological quality and safety for the consumer; 16 – The small number of intermediaries (from the farmer to the shop) is conducive to ensuring high food quality; 17 – I am able to pay about 10% more for organic food. **Cluster 2**: 2 – I use food supplements and vitamins; 3 – I very rarely eat out (in canteens, bars, restaurants); 6 – I usually read product labels; 7 – I am familiar with the food additive designations used; 8 – The foods I buy are safe; 9 – I am satisfied with the quality of the food I buy; 13 – I do most of my food shopping at the bazaar or small shops; 14 – I am happy to buy food directly from the farmer; **Cluster 3**: 11 – The main criterion for choosing food is its low price; 12 – I prefer to shop for food in big-box stores.

Figure 1. Dendrogram of the cluster analysis
Rysunek 1. Dendrogram analizy skupień
Source: own elaboration

When analyzing the structure of the ratings of the individual theses in Table 1, it is important to highlight the high percentage of respondents who appreciated the importance of food for maintaining good health and held the belief that many chemical food additives are

harmful. Respondents were also convinced of the benefits of SFSC for food quality. However, purchasing behavior was different, with just over 40% of respondents declaring the use of these chains.

The calculated mean scores of the individual theses, categorized by gender, were higher for all but two of the formulations rated by women. The theses relating to low prices as a criterion for food choice and preferred shopping in supermarkets were rated higher by men. This observation confirms the stereotype of a man on a shopping spree who behaves like he is on the hunt.

Table 1. Structure of evaluations of diagnostic theses and the average value of evaluations [%]
Tabela 1. Struktura ocen tez diagnostycznych i średnia wartość ocen [%]

Theses assessed	Likert scale scores					Average scores
	1 definitely not	2 rather not	3 neither yes nor no	4 rather yes	5 definitely yes	
1. Food is a major factor in shaping health.	1.7	1.2	5.4	44.5	47.2	4.34
2. I use food supplements and vitamins.	12.0	30.3	10.0	33.5	14.2	3.08
3. I very rarely eat out (in canteens, bars, restaurants).	11.2	22.0	13.4	29.3	24.0	3.33
4. Synthetic preservatives and colourings can be harmful to health.	1.2	4.9	10.3	31.3	52.3	4.29
5. Genetically modified products can cause health problems.	2.2	7.8	19.1	28.1	42.8	4.01
6. I usually read product labels.	10.5	21.8	15.9	40.3	11.5	3.21
7. I am familiar with the food additive designations used.	12.7	25.4	23.0	34.5	4.4	2.92
8. The foods I buy are safe.	2.0	5.9	47.4	38.6	6.1	3.41
9. I am satisfied with the quality of the food I buy.	1.2	14.2	27.6	49.1	7.8	3.48
10 The origin of the product is important to me.	3.4	13.4	19.6	39.1	24.4	3.68
11. The main criterion for choosing food is its low price.	11.0	33.7	22.0	27.4	5.9	2.83
12. I prefer to shop for food in big-box stores.	4.4	29.8	21.5	34.0	10.3	3.16
13. I do most of my food shopping at the bazaar or small shops.	6.1	33.0	18.6	31.8	10.5	3.08
14. I am happy to buy food directly from the farmer.	8.6	23.2	25.7	27.9	14.7	3.17
15. I believe that traditional foods ensure high biological quality and safety for the consumer.	1.0	2.4	21.5	44.0	31.1	4.02
16. The small number of intermediaries (from the farmer to the shop) is conducive to ensuring high food quality.	2.4	5.6	16.1	41.1	34.7	4.00
17. I am able to pay about 10% more for organic food.	1.7	7.3	23.0	41.1	26.9	3.84

Source: own elaboration

When analyzing the mean values of the scores categorized by place of residence, it is worth noting that the value of the mean score was lower in larger towns and cities for theses relating to the importance of the quality of food products for consumers' health, concerns about genetically modified food, and the importance for consumers of the place of origin of food. In larger towns, respondents' belief in the high quality of traditional foods decreased. Similarly, interest in buying food directly from farmers declined in larger towns. Thus, it can be concluded that among the respondents surveyed, the propensity to use SFSC is decreasing in larger cities.

Analyzing the mean scores of the theses, categorized by education, it can be seen that the interest in dietary supplementation and the belief in the harmfulness of chemical food additives increases with education. Along with the educational level of the respondents, they declared reading the labels of the products they bought more strongly and were more satisfied with the quality of the products they bought; the importance of the place of origin of the food also increased. In the surveyed group of respondents, the mean ratings of theses regarding the search for cheap food, preference for shopping in hypermarkets, and buying food directly from farmers decreased with increasing education. Therefore, it can be concluded that the education level is associated with the development of an informed consumer. However, with regard to the mean scores of the thesis on the benefits of SFSC, there were no differences related to education.

The results of the Pearson correlation analysis between the ratings of the individual theses are presented in Table 2. The ratings of the statements relating to shopping behavior (theses 10–17) were correlated with the ratings of the theses relating to the other characteristics under study (theses 1–9).

Table 2. Pearson correlation coefficients between diagnostic thesis scores

Tabela 2. Współczynniki korelacji Pearsona między wynikami tez

Thesis no. **	Thesis number **							
	10	11	12	13	14	15	16	17
1	0.1932*	–0.1525*	0.0792	0.0093	0.0642	0.1320*	0.1409*	0.1898*
2	0.0139	0.0289	0.1500*	–0.0616	–0.0782	–0.2048*	0.0464	–0.1142*
3	0.1707*	–0.0837	0.0492	0.1791*	0.0495	0.0532	0.1283*	0.1500*
4	0.3044*	–0.0841	–0.0474	0.1372*	0.1010*	0.2642*	0.1358*	0.1647*
5	0.1988*	–0.0390	–0.0818	0.1601*	0.0987*	0.1825*	0.2450*	0.1413*
6	0.3875*	–0.2924*	–0.0468	0.1658*	0.1616*	0.1142*	0.1306*	0.2665*
7	0.3104*	–0.1931*	–0.1028*	0.2996*	0.2371*	0.1835*	0.0797	0.2210*
8	0.2564*	–0.2142*	–0.1289*	0.1969*	0.2065*	0.2065*	0.1100*	0.2492*
9	0.0530	–0.2002*	–0.0136	0.0418	–0.0830	0.0154	0.0430	0.0476

* – statistically significant correlation coefficient; ** – numbers also as in Table 1

Source: own elaboration

It is worth emphasizing that respondents who rated higher the statements about the beneficial influence of SFSC on food quality (16), appreciated the importance of food in maintaining health (1), prepared meals at home (3), had a negative opinion about synthetic food additives (4) and genetically modified food (5). They declared to read labels (6) and were convinced that the food they bought was safe (8).

Preferences for shopping in hypermarkets (12) were significantly, negatively correlated with the evaluation and satisfaction with the quality level of the purchased food (8), as well as with the knowledge of food additive labels (7). In contrast, a positive, significant correlation coefficient was calculated with the use of dietary supplements.

Thus, it can be concluded that the respondents linked the length of the food supply chain to food quality. However, although respondents appreciated SFSCs, 33% definitely did not use them (Table1).

In order to analyze economic motives in the choice of food supply chain, two theses 11 and 17 were formulated. The evaluation of thesis 11 about the priority of low food price was significantly negatively correlated with the theses about the impact of food on health (1), label reading (6), knowledge of food additive labels (7) and belief, and satisfaction with the safety of the food purchased (8, 9). That means that those who prefer cheap food pay little attention to its quality and safety. In contrast, respondents who were willing to pay about 10% more for high-quality food (17), appreciated the importance of food for health (1), did not use dietary supplements (2), prepared their own meals (3) had a negative opinion on synthetic food additives and GMOs (4, 5), consciously bought food (6, 7), and were convinced of its safety (8).

In the light of the survey, it can be concluded that the economic factor is not the most important when choosing the food supply chain in the surveyed group of people. The calculated correlation analysis, in combination with the structure of evaluations, indicates that some respondents look for forms of food delivery that ensure its high quality and safety. For the other group these factors are less important, and it seems that the comfort of shopping is more important for them.

Summary and conclusions

In response to the research questions formulated, it can be concluded that: consumers surveyed were aware of the benefits of short food supply chains. They realize that regional food can be of higher quality. They expressed a lack of trust in food containing large amounts of synthetic additives and genetically modified components. However, the purchasing behavior did not coincide with beliefs. A small percentage of the surveyed people strongly confirmed buying food in the SFSC. For one-third of respondents, the main criterion for choosing food was low price, while two-thirds of the respondents expressed acceptance of slightly higher prices for safe, high-quality food.

Therefore, it can be concluded that in the group studied, purchasing behavior is somewhat at odds with awareness of the factors shaping food quality.

On the basis of the analyses carried out, the following conclusions can be drawn:

- a significant proportion of respondents stress the importance of food for maintaining good health and are aware of the harmfulness of chemical food additives;

- consumers in larger towns showed less awareness of the impact of food quality on their health, less concern about genetically modified food and less interest in buying food directly from farmers and therefore less interest in using SFSC;
- as their education increased, consumers showed greater interest in dietary supplements and a belief in the harmfulness of food additives, as well as greater interest in the information given on the labels of the products they bought and emphasised the importance of the products' origin. These consumers were less likely to seek cheap food;
- almost half of the respondents mentioned the benefits offered by SFSC, but interest in this food supply chain was lower among inhabitants of bigger towns, while education was not significant in this case.

References

Agboola S., Joel M.B.M., 2017: Classification of Some Seasonal Diseases: A Hierarchical Clustering Approach, Biomedical Statistics and Informatics 2(3), 122–127, https://www.doi.org/0.11648/j.bsi.20170203.16

Augère-Granier M-L., 2016: Short food supply chains and local food systems in the EU, [electronic source] https://www.europarl.europa.eu/RegData/etudes/BRIE/2016/586650/EPRS_BRI(2016)586650_EN.pdf [access: 18.12.2021].

Balon U., Dziadkowiec M., Sikora T., 2016: Cechy jakościowe a decyzje zakupowe Polskich konsumentów soków owocowych, Bromatologia i Chemia Toksykologiczna 49,4, 788–794.

Baran R., Marciniak B., Taranko T., 2017: Postawy konsumentów wobec marki pochodzenia polskiego i zagranicznego, Oficyna Wydawnicza SGH, Warszawa.

Ben-Hassen T., El Bilali H., Allahyari, M. S., 2020: Impact of COVID-19 on food behavior and consumption in Qatar, Sustainability 12(17), 6973, [electronic source] https://www.mdpi.com/2071-1050/12/17/6973/htm [access: 15.12.2021].

Chauhan V., Shah M.H., 2020: An empirical analysis into sentiments, media consumption habits, and consumer behaviour during the Coronavirus (COVID-19) outbreak, Purakala 31, 353–378, https://www.doi.org/10.13140/RG.2.2.32269.15846 [access: 15.12.2021].

Clausnitzer J., 2021: Food purchasing preferences during the COVID-19 pandemic in Finland 2020, [electronic source] https://www.statista.com/statistics/1121496/food-purchasing-preferences-during-the-coronavirus-pandemic-in-finland/ [access: 10.12.2021].

Cranfield J.A., 2020: Framing consumer food demand responses in a viral pandemic, Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie 68(2), 151–156, [electronic source] https://onlinelibrary.wiley.com/doi/full/10.1111/cjag.12246 [access: 15.12.2021].

Dobrowolski D., 2018: Paradoks XXI wieku – wiek głodu i niedożywienia czy nadmiaru i marnotrawstwa żywności?, [in:] D. Bogusz, M. Wojcieszak, P. Rachwał (eds), Poszerzamy Horyzonty t. VII, Mateusz Weiland Network Solutions, Słupsk, 23–33.

FAO, 2011: Global food losses and food waste. Extent, causes and prevention, Rome, [electronic source] https://www.fao.org/3/i2697e/i2697e.pdf [access: 7.10.2021].

Grzega U., Kieżel E., 2017: Trendy w zachowaniach konsumentów, [in:] M. Bartosik-Purgat (ed.), Zachowania konsumentów. Globalizacji, nowe technologie, aktualne trendy, otoczenie społeczno-kulturowe, PWN, Warszawa.

Jarosz M., n.d.: Piramida zdrowego żywienia i aktywności fizycznej dla osób dorosłych, [electronic source] https://ncez.pzh.gov.pl/abc-zywienia/zasady-zdrowego-zywienia/piramida-zdrowego-zywienia-i-aktywnosci-fizycznej-dla-osob-doroslych-2/ [access: 07.10.2021].

Kaszuba K., 2019: W globalnym łańcuchu dostaw marnujemy jedną trzecią wyprodukowanej żywności. Raport, [electronic source] https://www.wiadomoscihandlowe.pl/artykul/szokujaca0skala-maenowania-zywnosci-w-globalnym-lancuchu-dostaw-raport [access: 12.12.2021].

Kawecka A., Gębarowski M., 2015: Short Food Supply Chains – Benefits for Consumers and Food Producers, Journal of Agribusiness and Rural Development, 3(37), 459–466, https://doi.org/10.17306/JARD.2015.49

Kieżel E. (ed.), 2010: Konsument i jego zachowania na rynku europejskim, PWE, Warszawa.

Kneafsey M., Venn, L., Schmutz U., Balasz B., Trenchard L., Eyden-Wood T., Bos E., Sutton G., Blackett M., Santini F., Gomez Y., Paloma S. (eds), 2013: Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics. Publications Office of the European Union, Luxembourg, [electronic source] https://publications.jrc.ec.europa.eu/repository/handle/JRC80420 [access: 10.12.2021].

Kokkorisa M.D., Stavrova O., 2021: Meaning of food and consumer eating behaviors, Food Quality and Preference 94, 104343, [https://doi.org/10.1016/j.foodqual.2021.104343

KPMG, 2020: Czy pandemia COVID-19 trwale zmieni zwyczaje zakupowe Polaków?, [electronic source] https://home.kpmg/pl/pl/home/media/press-releases/2020/09/media-press-czy-pandemia-covid-19-trwale-zmieni-zwyczaje-zakupowe-polakow.html [access: 15.12.2021].

Krajewski K., Kołożyn-Krajewska D., Wrzosek M., 2014: Ocena strat i marnotrawstwa żywności w obiektach handlowych a działania strategiczne handlu – wyniki badań; Etnocentryzm konsumencki na rynku produktów żywnościowych. Stan i perspektywy rozwoju, Marketing i Rynek, 6(CD), 835–849.

Kwasek M., 2016: Zrównoważona konsumpcja żywności sposobem na zmniejszenie marnotrawstwa żywności, [electronic source] https://docplayer.pl/25487298-Zrownowazona-konsumpcja-zywnosci-sposobem-na-zmniejszenie-marnotrawstwa-zywnosci.html [access: 15.12.2021].

Lins S., Aquino S., 2020: Development and initial psychometric properties of a panic buying scale during COVID-19 pandemic, Heliyon, 6(9), e04746, [electronic source] https://www.sciencedirect.com/ science/article/pii/S2405844020315899 [access: 15.12.2021].

Maciejewski B., 2018: Miejsca zakupu żywności polskich konsumentów, Handel Wewnętrzny 1(372), 99–108.

Matwiejczuk R., Tłuczak A., 2018: Wpływ koncepcji logistycznych na rozwój krótkich łańcuchów dostaw w sektorze rolno-spożywczym, Gospodarka Materiałowa i Logistka 77, 11/2020, https://www.doi.org/10.33226/1231-2037.2020.11.2

Melski K., Walkowiak-Tomczak D. (eds), 2016: Żywność dla świadomego konsumenta, Wydział Nauk o Żywności i Żywieniu, Uniwersytet Przyrodniczy, Poznań.

Michalczyk J., 2018: Zrównoważony łańcuch dostaw żywności. Wybrane inicjatywy, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu 523, 221–241.

Mróz B., 2013: Konsument w globalnej gospodarce. Trzy perspektywy, Oficyna Wydawnicza SGH, Warszawa.

Mulawka T., 2021: Czym charakteryzuje się łańcuch dostaw artykułów spożywczych i jak można go skrócić?, [electronic source] https://www.3dbinpacking.com/pl/blog/lancuch-dostaw-artykulow-spozywczych/ [access: 05.12.2021].

Renting H., Marsden T.K., Banks J., 2013: Understanding alternative food networks: exploring the role of short food supply chains in rural development, Environmental and Planning A 35(3), 393–411.

Rozporządzenie Delegowane Komisji (UE) NR 807/2014, Dz.U. UE L 227/1 [electronic source] https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:32014R0807&from=EN [access: 10.12.2021].

Rozporządzenie Parlamentu Europejskiego i Rady (UE) NR 1305/2013, Dz.U. UE L 347/487 [electronic source] https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:32013R1305&from=RO [access: 10.12.2021].

Serafin R., Pilis D., 2020: Krótkie łańcuchy dostaw żywności w programach rozwoju wsi i rolnictwa. [in:] R. Serafin i D. Pilis (eds), Przykłady organizacji krótkich łańcuchów dostaw żywności, Centrum Doradztwa Rolniczego w Brwinowie Oddział w Krakowie, Kraków, 10–17, [electronic source] http://cdr112.e-kei.pl/cdr/images/2021/03/Raport-KLD.pdf [access: 17.12.2021].

Serafin R., Pilis D., 2020: Przykłady organizacji krótkich łańcuchów dostaw żywności, Centrum Doradztwa Rolniczego w Brwinowie. Oddział w Krakowie, Kraków.

Sobczyk G., 2018: Zachowania konsumentów wobec nowych trendów konsumpcji – wyniki badań. Annales Universitatis Marie Curie-Skłodowska, Lublin – Polonia, 52, 1, https://www.doi.org/10.17951/ h.2018.52.1.171

Stadtler H., Kilger Ch. (eds.), 2008: Supply Chain Management and Advanced Planning, Conception, Models, Software and Case Studies, Springer, Berlin, [electronic source] https://mynotesonsystemicthinking.files. wordpress.com/2011/02/scm-and-adv-planning.pdf [access: 18.12.2021].

Stasiu K., Maison D., 2014: Psychologia konsumenta, PWN, Warszawa.

Stenmarck A., Jensen C., Queste, T., Moates G., 2016: Estimates of European food waste levels, Stckholms FUSIONS, Stockholm, [electronic source] https://www.eu-fusions.org/phocadownload/Publications/ Estimates%20of%20European%20food%20waste%20levels.pdf [access: 05.10.2021].

Strużyna A., 2020: Problematyka ciągłości łańcucha dostaw w spożywczym biznesie ekologicznym, Współczesna Gospodarka 11 is.1(35), 29–38.

Szczepaniak I., Grochowska R., 2020: Skala strat i marnotrawstwa żywności w ogniwie przetwórstwa spożywczego w Polsce i przyczyny ich powstawania, [in:] S. Łaba (ed.), Straty i marnotrawstwo żywności w Polsce. Skala i przyczyny problem, IOS-PIB, Warszawa.

Szymańska E., Lukoszova X., 2019: Krótkie łańcuchy dostaw produktów żywnościowych, Ekonomika i Organizacja Logistyki 4(1), 91–101.

Szymańska M., 2019: Marketing żywności w ramach krótkich łańcuchów dostaw, Postępy Techniki Przetwórstwa Spożywczego 2, 133–136.

Tundys B., 2015: Krótkie łańcuchy dostaw produktów spożywczych (SFSC) – ujęcie teoretyczne i praktyczne. Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach 249, 94–110.

Yuen K. F., Wang X., Ma, F., Li K.X., 2020: The psychological causes of panic buying following a health crisis, International Journal of Environmental Research and Public Health,17(10), 3513, [electronic source] https://www.mdpi.com/1660-4601/17/10/3513/htm [access: 14.12.2021].